GOVERNMENT OF INDIA
ATOMIC ENERGY
LOK SABHA

STARRED QUESTION NO:284
ANSWERED ON:22.03.2017
Third Stage of Nuclear Power Programme
Reddy Shri Konda Vishweshwar

Will the Minister of ATOMIC ENERGY be pleased to state:

(a)whether appreciable developments and achievements have been made in implementing the third stage of Indian Nuclear Power Programme;

(b)if so,the details thereof including technological challenges and concerns identified in this regard;

(c)the time by which the said technology is likely to be made commercially operational; and

(d)the funds earmarked/allocated/released during each of the last three years for the said purpose?

Answer

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (Dr. JITENDRA SINGH) :

(a)&(b)The third stage of Indian nuclear power programme contemplates using Thorium along with Uranium-233 as fuel in Thorium based reactors. With sustained efforts over years, India has gained experience over the entire thorium fuel cycle on a semi-industrial scale. The developmental activities include studies in thorium extraction, fuel fabrication and irradiation, reprocessing studies including construction of an engineering-scale power reactor, thorium reprocessing facility and setting up of uranium-233 fuelled Purnima and KAMINI research reactors. Some of the important highlights of these activities overcoming challenges are the following:

i.Thorium Oxide (Thoria) pellets contained in normal bundles have been used in the initial core of our operating Pressurised Heavy Water Reactors (PHWRs) for breeding U233. Thoria based fuels have also been irradiated in the research reactors CIRUS and Dhruva. After such irradiations, these fuel elements have been examined in the laboratories at BARC, yielding excellent results.

ii.The irradiated thoria has been reprocessed to extract uranium-233. The recovered uranium-233 has been fabricated as fuel for the 30 KW (thermal) KAMINI reactor, which is in operation at Indira Gandhi Centre for Atomic Research (IGCAR) at Kalpakkam.

iii.A 300 MWe Advanced Heavy Water Reactor (AHWR) using thorium based fuel has been designed and developed. This reactor will serve as a technology demonstrator for not only the thorium fuel cycle technologies, but also several advanced passive safety features. A Critical Facility has been constructed in BARC, and is being used for carrying out experiments to validate the reactor physics design of AHWR.

iv.India has also constructed a demonstration scale reprocessing facility for separation of Uranium 233 from spent thoria fuels.

Bhabha Atomic Research Centre (BARC) and other research organisations attached with DAE are engaged in various R&D activities to address the utilisation of thorium in different types of reactors, including efforts aimed at enlarging the existing thorium cycle experience to a bigger scale.

(c)Large scale Thorium based nuclear reactors for commercial operation is planned in the 3rd stage programme. Thorium is planned to be introduced in the fuel cycle when sufficient capacity of fast breeder reactors of 2nd stage programme are built and are in commercial operation. As per the present projection, Thorium based reactors are envisaged to be operating in commercial scale after year 2050.

(d)As part of the recent plan projects, a total of Rs.292 Crore has been allotted for Research and Development programme on thorium based reactors.

The funds earmarked/allocated in the last 3 years.

2017: Rs.4.25 crore
2016: Rs.8.70 crore
2015: Rs.8.20 crore

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